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EXAMINER

PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 07/03/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/380/630

Applicant(s)

Hirofashi Hayakawa et al

Examiner

M.L. Padgett

Group Art Unit

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—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 11/14/01
- ☒ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-3, 5-6 + 9-25 is/are pending in the application.
- ☐ Claim(s) _____ is/are withdrawn from consideration.
- ☒ Claim(s) 1-3, 5-6 + 9-25 is/are allowed.
- ☐ Claim(s) _____ is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
 - ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

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1. Claims 1-3 and 9-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 has been amended to have contradictory requirements. In line 9+ of the marked-up copy the second laser beam is removing a part of the deposit. Note the step never actually says what the laser beam is "irradiating" or "scanning". While lines 14-15 claim "the deposit caused to degenerate by irradiation by said second laser beam...", which can't happen if it has been removed as previously required. What is intended to be happening in claim 1 is unclear and unexamined as written.

Claims 9 and 11-12 are clearly directed to a material, i.e. the statutory class of composition, where specific steels, or any metal, compound or intermetallic are claimed; but claims 10, 13-25 with the same preamble appear to claim a structure, which a different statutory class, hence objected to as inconsistent. Note the claimed structure according to the preamble does NOT include the substrate that it resides on, because the substrate itself is NOT marking material, so applicants might wish to note that the substrate characteristics claimed (light transparent, etc.) do not actually effect the claimed ^{marking} material. While this is not really a formal problem, it does significantly effect the meaning of the claims, such that applicant's might not be saying what they intend.

Claims 10 and 13-25 are further contradictory as amended with respect to claim 5, because claim 5 requires a chemical reaction, so what is deposited in the "material to be marked" is no longer the marking material as defined in the independent claim, hence claiming a product with a thin film of it is contradictory.

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Applicant's explanation and discussion of "QR Code" and "Veri Code" on p. 4 of the 11/14/01 response and the website ^{print} ~~point~~ out on QR Code is appreciated and informative, potentially providing adequate definition and support thereof. However, the examiner has a couple of questions. Are these terms known to one of ordinary ^{skill} ~~skill~~ in the art, such that they are used in the common speech, or are they ^{tradenames} ~~tradenames~~ or trademarks? If the latter their inclusion in the actual claims is improper, but the examiner is uncertain from reading the provided descriptions, which is the case. Note, if "Data Code" means other than simply any code that supplies data, i.e. information, and has some specific meaning as described for the other two codes, as possibly implied by its capitalization, it should be included in this discussion. Pending resolution of these questions, the following rejection ^{is made} ~~is made~~.

Claims 15 and 18-22 potentially contains the trademark/trade name QR Code or Veri Code (or Data Code (?)). Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a patterning or identification system and, accordingly, the identification/description is indefinite.

2. Claims 10, 16 and 23-25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled

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in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In the original claims, the "transparent body" or "transmissive body" referred to either the material to be marked or the marking material (so this appears to be an enablement instead of new matter issue), the ⁿas previously amended (5/55/01) claim 10, etc. were ambiguous due to antecedence problems. The present amendment has clarified this, such that in claims 10, 16 and 23-25, the thin film is on the surface of the "material to be marked", hence appears to be a product of the process. Note that "a thickness of 10^{μm} or less" is inclusive of zero, i.e. no thickness. On page 10 of the specification, it is disclosed that "black film ~~M~~ of 0.2^{μm}" was formed on glass plate 2, with similar disclosures on p. 33, 35 and a 0.3^{μm} film on p. 38. Page 30 discusses forming almost uniform films, with thickness variations of 3 %, but no actual values. So scanning of the specification revealed no support for forming marking^s of the marking material in the ranges claimed in 10 or 16 or 23-25. However, p. 25 discloses film thicknesses used for metal film 1a, i.e. the starting material that is transferred to the substrate/material to be marked, which lists incremental thicknesses stating at 0^{μm}, 2^{μm}, ... or 10^{μm}, noting that 2^{μm} or less are actually practical for use. While this related to the values claimed, its ~~for~~ the starting material, not the end result, which therefore lacks^{enable} amendment.

3. The disclosure is objected to because of the following informalities: On reviewing the specification for support for modifications made to the claims, it was noted that the descriptions on p. 24 of the specification do not match descriptions written in the figures. For example, see "soda glass for glass plate 1" on line 8, while Fig. 1 (a) says, "metal plate 1". It is noted that Fig. 4 (a) agreed^s with page 24, but the same reference number may not have different meaning in different figures. It is suppose to be consistent

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throughout the specification, in order to avoid confusion. These inconsistencies are throughout the figures, and will not be individually enumerated. Page 26 further indicate^s "a silicon wafer is used as substrate 1" or also as "2", and "organic matter ... or metal or inorganic matter ... silicon nitride is used as thin film 1a", while Fig. 4 clearly labels "1a metal film".

The examiner further notes, that when writing the units "~~µm~~" in the specification, applicant's typing has left enough space between the "~~µ~~" and the "m" that the printer may not (can't accurately predict) print them together as they should be. On p. 46, the ~~µ~~ is improperly written in a separate line from m.

Proof reading for spelling is also needed. On p. 29, line 6, see "wit" and on line 13 "Atwo-". On page 30, line 7 "producing speck" or p.32, line 9 "a lot of speck"? Missing some plurals? Page 48 "reflexibility"?

Appropriate correction is required.

4. Claims 1-3 and 9-25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Previously, the requirement to change the color of the deposit treated (degenerated) by the second laser, could be considered to read on the denaturing option, but that has been deleted. No teaching of heating via laser or other wise to change the color of removed material was found. Therefore, this change appears to introduce New Matter.

Considering the possibility that the intent of claim 1, is to cause the second laser^{to cause} the color change (if one may refer to that as degenerating or denaturing), then the only disclosure that did this by heat of the second laser was Embodiment 7, starting on p. 34, which after laser deposition

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referred to as the first process, a second laser power was used to pattern, so that locally absorbed heat changed the $\text{TiO}/\text{Ti}_2\text{O}_3$ deposit to TiO_2 which was transparent. Page 36 noted other Ti containing alloys or compounds were applicable to this embodiment, as was black silver oxide deposit, which could be changed to white. No other materials as listed in claim 9 (generic categories) or claims 11 or 12 (steels) were said to be applicable, hence appear to include New Matter.

It was noted that the last embodiment, # 13, starting on P. 47, discusses color change induced by irradiation from a second laser, but does not discuss heat as the cause, but uses a band pass filter to change the wave length of the irradiation when treating ITO deposits, causing white original deposit to turn black, while the unfiltered laser caused little visible change. Page 48 noted metal and compound grouping^S as listed in claim 9 would have been expected to ^{have} ~~have~~ their [reflectivity] as well as transmissivity varied by the technique of this (¹³#3) embodiment. A change in irradiation wave length to cause color change does not provide support for heat causing the color change for deposit treated by the second laser.

The only other place where color change was found discussed was on p. 15-17 concerning only later heat treatment processes at 650°C for 30 minutes, but in this process the second laser beam was only used for patterning by removal (which is consistent with line 9 (marked up version) it claim 1. However, the later heat treatment is applied to undisturbed, i.e. remaining, deposits not irradiated by the second laser. Heat treatment of this material by this option is not, and has never been claimed, hence has never been search or treated by art, and would be considered a different process than preciously examined. It was also noted that

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applicant's background indicates that such heating occurs during further processing in the prior art.

Claims 1-3 and 9-25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The above-discussed lack of support for the present set of options for the claims as amended, show the lack of enablement.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cook, optionally in view of Totah('462) or Addiego et al.

These claims are directed to "A ^rmaking material" rather than the process of the independent claims, where the scope as written may include just the composition of the material used for the marking of the process, or perhaps also the mark itself before any chemical reaction or color change regardless of substrate. The particular process of deposition is not relevant to the patentability of the "making material", or what reactions the marking material may undergo. As

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both steel, various metals and metal alloys are taught, claims 9, 11-13 at least could be considered completely anticipated, or that it is obvious to one ordinary skill that the material of metal and steel or a thin film there^{of} on a substrate is independent of the process in which it is intended to be used. However, the previously applied rejection remains applicable to the composition/product claims, as their ~~content~~ is essentially the same as before.

In Cook, note that both irradiation through the substrate (material to be marked) as in Fig. 5, described in col. 6, lines 29-52, or irradiating through the support for the transfer (marking) material as in Fig. 2, are taught to be useful for patterning, such as for metal circuit or repair of photo masks (on glass substrates). This patterning reads on the claimed patterns, as circuits, etc..., can definitely be considered diagrams. Pattern line resolution is taught to depend on separation of substrate and foil, as well as foil thickness and thermal conductivity (col. 4, line 35-54). Tests show use of a steel alloy foil for transfer and a gap of approximately 0.025 mm=25^μm, which is squarely within the gap range claimed by applicant, hence previous omission of claim 7 from the claims list remains clearly inadvertent. Col. 5, lists other useful metals (Ag, Au, Cr, Cu, In, Sn, Ti, etc...) and alloys, as well as uses. The properties of the transferred material are inherently modified during the process. While the claimed codes or bar codes are not discussed in Cook, they are just a pattern variation, dependant on desired end use, and any pattern design would have been obvious as a design choice dependant on labeling/identification and use requirements, especially those already in the public domain and in use. Bar codes accompanied by alphanumeric characters have been in use for labeling all kinds of articles for quite a number of years now.

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Cook does not teach a second use of laser irradiation, nor the specific steels or any thicknesses of deposit. As the thicknesses of the foils for this process are generally quite thin, so are the films produced, with optimum thickness of the solid layer of foil taught to vary with specific application (col. 4, lines 7-34). Additionally, when irradiating through the substrate, the resultant deposit limits film thickness as it progressively blocks the light, hence the thickness as claimed would have been obvious or expected by one of ordinary skill to be within claimed range from the limits induced by source material or attenuation. As Cook's process is applicable generally to metals, and particularly mentions steel alloys, use of any common steel alloys would have been obvious, (of which the classes of carbon steel, ferrite steel and martensite steel are conventional forms), depending on properties desired in the final end product, because all would have been expected to be effectively treated. For the claimed "marking material" the use of a second laser is irrelevant, since once the color has been changed it is no longer the marking material defined by the claims. Also patterning of the marking material on the material to be marked can be produced during transfer, to produce the same structure ^S and ⁿ patterning with a second laser, which is sufficient to cover the limitations of a product claim. Product-by-process language does not necessitate that the process be used in making the structure, only limits the bounds of the structure.

Applicants appear to have changed claim 1 to necessarily require the second laser beam to remove material deposited by the first, but have also said that was "caused to degenerate". Tatah ('462) as previously applied (below) remains relevant due to the uncertainty of the meaning or intent of claim 1, from which these composition/product depend.

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Alternately, it would have been obvious to one of ordinary skill to make repair on patterns, such as circuit boards, using lasers for laser abatable deposits, which anything deposited by Cook's technique is, because such a procedure is already shown to be effective. Note that direct removal without intervening material would have been expected to need less power to cause ablation. Addiego et al supplies further support and motivation for these arguments (Abstract, summary), as it shows that need for repair and use of laser removal for such repair are old and well known, ~~as it shows that need for repair and use of laser removal for such repair are old and well known~~, hence would have been obvious to apply to Cook's deposited materials to further refine the patterns.

Cook does not color change in the deposit and the amendments have introduced significant uncertainty in the meaning of the claimed process steps, precluding more meaning discussion, hence the process claim have been removed from this rejection.

Tatah (462) also produces laser ablation film patterns, including discussing repair processes (Fig. 5-6 and col. 6, lines 7-35), but the Tatah (462) configuration is analogous to Cook's fig. 2. After deposition, Tatah teaches enhanced binding by repeated reflection of laser light to heat the substrate deposited on (abstract, figure 3; col. 4, lines 10-56), hence it would have been obvious to use the post-treatment process of Tatah (462) in Cook, for the benefits taught and because equivalence of deposition processes is taught in Cook. Lower power would have been expected, as vaporization is not desired in the post-treatment.

7. Tatah ('336) has bonding teachings equivalent to the (462) reference, and Landsman has multiple laser treatment, transfer and post-treatment that are equivalently applicable to

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limitations of second laser treatments. Robertson shows that laser marking to form bar code is a known design.

8. Claims 9-10 remain rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hase et al.

In Hase et al, see the abstract; fig. 1; col. 2, lines 23-68; col. 3, lines 3-16; and Ex. 1. Substrate 3 (various oxide⁵, quartz glass or sapphire) in Hase transmits radiation as claimed and vaporizes target material (i.e. marking material) that reacts with gas (oxygen) in the gap, as in claims 5-6. Heating of the substrate is irrelevant. Note that target materials metal oxides used in super[^]conductors reads on the broad requirements of claim 9, that the making material may be "a compound." The film thickness formed is 0.1-10~~μ~~m. As the Hase et al starting (target) material is an oxide, and the deposit is an oxide, claim 10 has been maintained in the 102, considering the uncertainty of applicant's intended claim meaning, as discussed above in section 1, and that the reaction with oxygen compound to the types of reactions generally discussed in applicant's specification. Above discussed considerations for composition/product versed method claims are again applicable.

9. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al as applied to claims 9-10 above, and further in view of Cook.

Hase et al does not teach a range of gap distances that may be used in their process, however example 1 in table 1 provided use of a 3mm (3000^μm) target-substrate (gap) distance at an oxygen partial pressure of 10 torr and a comparison with a 50mm (5x10⁴^μm) target-substrate (gap) distance at 0.1 torr O₂ partial pressure, showing a trend of a much high^{er} film forming speed from many fewer laser shots. Hase et al's back[^]ground notes that there is a

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dependence on oxygen partial pressure and gap distance in achieving desired results or characteristics from the deposition process, hence it would have been obvious to one of ordinary skill to use routine experimentation to determine the range of gap parameters applicable to the generic process of Hase et al, as represented by their claim 1 ^{in order} ~~under~~ to effectively apply the process. The process of Cook as described above in section 6, as previously noted has general teachings on pattern resolution being dependant on the gap, as well a specific gap distance example of $0.025\text{mm} = 25\mu\text{m}$ (col.4). Hence, it would have been further obvious to one of ordinary skill to employ Hase et al's $25\mu\text{m}$ gap when conducting routine experimentation due to its demonstrated effective ^{ness} in a like configuration laser transfer process ^{es} and desirability for pattern resolution, which would be equally important to circuit patterns in super ^{conductor} devices.

10. Cook in view of Landsman and Braudy was previously applied to claim 1-4, but if the intended claim 1 as now amended is intended to correspond to applicant's embodiment, that rejection would appear to no longer correspond. Cook was discussed above, and as noted *Fig. 2 and 5 configurations, whereas Landsman and Braudy et al use* teaches Fig. 2 types. In Landsman, see abstract, figures and col. 2-4, particularly col.3, lines 24-29, 48 - col.4, lines 30 for transfer, patterning techniques and post-deposition heating. In Braudy et al, see abstract, figures 1-3; col. 2, lines 1-52; col. 3 and table. Landsman shows that multiple lasers (transfer, then treating) are appropriate for dye and pigment type materials, while Braudy et al supplies many possible pigments, hence it would have been obvious to one of ordinary skill in the art that such dyes and pigments would have been both useful and effectively treated in processes of Cook due to the overlapping mechanisms employed, but the dyes and pigments used there ⁱⁿ, while colored, do not change their color in application of heat (or with a different wavelength laser as in applicant's embodiment 13).

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(11) Other art of interest, included Drew et al, Frausto et al and Ronn et al with configurations and materials of interest, and the Seiji et al Japanese reference. Braudy (3,745,586) cited as having useful alternatives in Landsman (col.4, lines 4-5) and teaching use of gaps of 4-5 mils (i.e. about 92 to 130 ^{μ m}~~mm~~), further showing the gap parameters are old and well known, as previously discussed.

(12) Applicant's arguments filed 11/14/01 and discussed above have been fully considered but they are not persuasive. The previously applied Braudy et al was missing from the PTO^{file and 892} and is being supplied to applicant incase it is similarly missing from applicant's files.

(13) Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

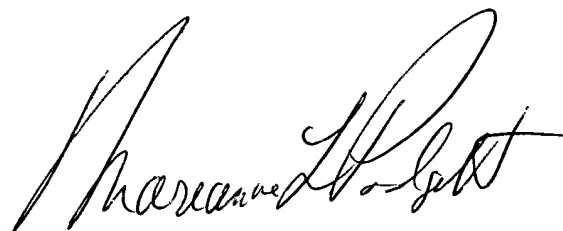
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

(14) Any inquiry concerning this communication or earlier communications from the examiner should be directed to M L. Padgett whose telephone number is 703-308-2336 on

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Monday- Friday from about 8 am to 4:30 pm, and Fax # (703) 872-9311 after final (official) and 305-6078 (unofficial)

Examiner Padgett/mn
June 27, 2002.

A handwritten signature in black ink, appearing to read "Marianne Padgett". The signature is fluid and cursive, with a large initial "M" and "P".

MARIANNE PADGETT
PRIMARY EXAMINER
GROUP 1700